

Remarks

This Amendment replaces the Amendment dated April 30, 2004, which was in response to the Office Action dated 02/12/2004. The Amendment dated April 30, 2004 was deemed to be not fully responsive due to the recitation in claim 34 of "the recess sized and shaped to retain and center the bumped contact during the electrical engagement, the recess having a diameter approximately equal to that of the bumped contact and a depth approximately equal to a height of the bumped contact". The examiner maintains that this feature is present in the non-elected species of Figures 2A-2D (Figures 5A-5J), but not in the elected species of Figures 7A-7I.

Applicant disagrees with this holding for essentially the reasons advanced in the Response dated July 23, 2004. In Figures 7F and 3B, the recess 20B is configured to perform retaining and centering functions, even if it appears in the drawings to be slightly larger than the bumped contact 14B. In addition, the limitation of the recess 20B having a diameter and a depth approximately equal to the bumped contact 14B are met by the recess 20B of Figures 7F and 3B.

Nonetheless, by this Amendment the above recitation has not been included in amended independent claim 34. In addition, similar recitations have not been included in amended independent claims 39 and 49. As the Amendment dated April 30, 2004 appears to have not been entered, the "Listing Of Claims" lists and amends the claims as they stood in the Amendment dated January 20, 2004.

In addition to traversing the holding of non responsiveness, Applicant objects to the handling of this holding by the Examiner. Applicant had filed a Response to the Office Action dated 07/20/04 on 07/26/2004. However,

the examiner did not respond to this Response until 11/12/2004.

MPEP 714.05 states in part:

All amended applications forwarded to the examiner should be inspected at once to determine the following:

(C) If the amendment is fully responsive (MPEP §714.03 and §714.04) and complies with 37 CFR 1.121.

This procedure was not followed by the examiner, which necessitated payment of a four month extension fee for the present Amendment in the amount of \$1530. In addition, Applicant was not able to argue against the latest holding of non responsiveness because of the likelihood that these arguments would not be considered prior to expiration of the period for response. Accordingly, Applicant's rights have been prejudiced by the actions of the examiner.

Rejections Under 35 USC §102 and §103

Claims 34, 38-39, 43, 49 and 51 have been rejected under 35 USC §102(b) as being anticipated by Fjelstad et al (US Patent No. 5,632,631).

Claim 38 has been rejected under 35 USC §103(a) as being unpatentable over Fjelstad et al. (US Patent No. 5,632,631) in view of Sugiyama et al. (US Patent No. 4,766,666).

Claims 40-41 and 50 have been rejected under 35 USC §103(a) as being unpatentable over Fjelstad et al. (US Patent No. 5,632,631) in view of Kazle (US Patent No. 5,936,847).

Argument

In response to the rejections, independent claims 34, 39 and 49 have been amended to recite features which further distinguish the claimed method from the prior art. These features, in combination with other recited steps and

features, are submitted to define a method which is both novel and unobvious over the prior art.

As requested in the Office Action, a reading of the amended claims on the drawings and specification is as follow.

34. A method for fabricating an interconnect (**10-Figure 1, page 9, lines 6-30**) for electrically engaging a semiconductor component (**18-Figure 3B**) with at least one bumped contact (**14B-Figure 7G**) having a radius (R-Figure 7G) comprising:

providing a substrate (**14B-Figure 7A, page 18, line 33 to page 19, line 3**) having a surface (**26B-Figure 3C**);

forming a plurality of leads (**22B-Figure 7C, page 19, lines 10-14**) on the surface (**26B-Figure 3C**) configured to electrically engage and support the bumped contact (**Figure 3B, page 4, lines 18-21**), the leads having terminal portions (**Figure 7G**) and support portions (**Figure 7G**);

forming a recess (**20B-Figure 7F, page 21, lines 10-14**) in the surface configured to cantilever the terminal portions over the recess with the support portions on the surface supporting the terminal portions (**Figure 7G**) for movement within the recess during electrical engagement of the bumped contact (**page 13, lines 5-8**); and

shaping the terminal portions with a curvature (**Figure 7G**) approximately equal to the radius of the bumped contact (**page 21, lines 15-20**).

35. The method of claim 34 further comprising forming outer layers (**46B-Figure 7B and 3D, page 19, lines 4-9 of the specification**) on the terminal portions configured to provide a non bonding surface for the bumped contact.

38. The method of claim 34 wherein the substrate comprises a semiconductor material (**page 10, line 4**) and

the forming the recess step comprises etching (page 16, line 30).

39. A method for fabricating an interconnect (10-Figure 1, page 9, lines 6-30) for electrically engaging a semiconductor component (18-Figure 2C) having at least one bumped contact (14B-Figure 7G) having a shape (page 13, line 2) comprising:

providing a substrate (14B-Figure 7A, page 18, line 33 to page 19, line 3) having a surface (26B-Figure 3C);

forming a metal layer (leads 22B-Figure 7C, page 19, lines 10-14) on the surface (26B-Figure 3C);

forming a plurality of leads (leads 22B-Figure 7C, page 19, lines 10-14) on the substrate configured to electrically engage and support the bumped contact (Figure 3B, page 4, lines 18-21), the leads having terminal portions (Figure 7G) with the projections thereon and support portions (Figure 7G);

etching a recess (20B-Figure 7F, page 21, lines 10-14) in the surface configured to cantilever the terminal portions over the recess with the support portions on the surface supporting the terminal portions for movement within the recess during electrical engagement of the bumped contact (page 13, lines 5-8); and

shaping the terminal portions with a curvature (Figure 7G) matching the shape of the bumped contact (page 13, lines 1-5, page 21, lines 15-20).

40. The method of claim 39 wherein the shaping step comprises pressing the leads with a tool (page 21, lines 18-20).

41. The method of claim 39 wherein the shaping step comprises heating the leads (page 21, lines 18-20).

43. The method of claim 39 further comprising forming a connecting segment (**40B-Figure 7F, page 19, lines 11-14**) on the substrate electrically connecting the leads, a conductive via (**42B-Figure 7E, page 19, line 15 to page 20, line 31**) in the substrate in electrical communication with the connecting segment and a contact (**38B-Figure 7F, page 20, line 32 to page 21, line 9**) on the substrate in electrical communication with the conductive via.

49. A method for fabricating an interconnect (**10-Figure 1, page 9, lines 6-30**) for electrically engaging a semiconductor component (**18-Figure 2C page 9, lines 6-30**) having a plurality of bumped contacts (**16-Figure 2C page 9, lines 6-30**) on comprising:

providing a substrate (**14B-Figure 7A, page 18, line 33 to page 19, line 3**);

forming a plurality of interconnect contacts (**14B-Figure 7G, page 18, line 2 to page 21 line 20**) on the substrate configured to electrically engage the bumped contacts (**page 9, line 26**), each interconnect contact comprising a plurality of leads (**leads 22B-Figure 7C, page 19, lines 10-14**) having terminal portions (**30A-Figure 2B, page 10, line 33**) and projections (**blades 28B-Figure 7B, page 19, lines 4-5 described as projections on page 4, line 25**) on the terminal portions;

forming outer layers (**46B-Figure 7B and 3D, page 19, lines 4-9**) on the terminal portions and projections configured to provide non-bonding surfaces for the bumped contacts (**page 13, line 27, to page 14, line 2**)

forming a plurality of recesses (**20B-Figure 7F, page 21, lines 10-14**) in the substrate proximate to the leads configured to cantilever the terminal portions of the leads for movement within the recesses during the electrical engagement (**page 12, lines 2-5**); and

shaping the terminal portions (Figure 7G) to match a shape of a bumped contact (**page 13, lines 1-5, page 21, lines 15-20**).

50. The method of claim 49 wherein the outer layers comprise a conductive polymer (**page 14, lines 1-2 of the specification**).

51. The method of claim 49 wherein the projections comprise blades (**blades 28B-Figure 7B, page 19**).

With respect to the claim amendments, amended independent claim 34 recites "shaping the terminal portions with a curvature approximately equal to the radius of the bumped contact". Amended independent claim 39 recites "shaping the terminal portions with a curvature matching the shape of the bumped contact". Amended independent claim 49 recites "shaping the terminal portions to match the shapes of the bumped contacts". The shaping step is shown in Figure 7G and is described on page 21, lines 16-20 and page 13, lines 1-5 of the specification.

In Fjelstad et al. the contacts 20 (Figure 3) have a curvature which is opposite to that of the leads 72 (Figure 3). Accordingly the 35 USC §102 rejections over Fjelstad et al. are submitted to have been overcome by the additional recitations.

With respect to the 35 USC §103 rejections based on Fjelstad et al. and Sugiyama et al. the secondary reference was cited for its teaching of an etching step. In support of the proposed combination of Fjelstad et al. and Sugiyama et al. the Office Action states:

"It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Fjelstad by providing a semiconductor material and anisotropic etching, as taught by Sugiyama, for the purpose of electrically communicating between two surfaces using

the semiconductive material instead of metal and the anisotropic etching allows one side etching to form recesses."

However, Applicant is unable to ascertain which two surfaces, and which metal conductors, could be replaced in Fjelstad et al. by an anisotropic etching step. Although the above quoted statement from the Office Action was submitted as a justification for the proposed combination, there would be no reason to substitute semiconductor materials for the metal layers in the Fjelstad et al. connector. In this regard, semiconductor materials do not have the same conductivity as metals, and can be more difficult to shape and insulate than metals.

With respect to the 35 USC §103 rejections based on Kazle, this reference was cited as teaching a conductive polymer 140a, 140b on contacts 12a, 12b. However, the conductive polymer 140a, 140b in Kazle is intended to bond to the component contacts (note Figure 3 and column 4, lines 63-67 of Kazle). In contrast, independent claim 49 and dependent claim 45, recite the step of providing outer surfaces on the leads "configured to provide a non bonding surface for the bumped contact". The forming the non-bonding layer step of the present method is recited in the claims, but is not taught or suggested Kazle.

Conclusion

In view of the amendments and arguments, the rejections are submitted to have been overcome. Accordingly, favorable consideration and allowance of claims 34-35, 38-41, 43 and 49-51 is respectfully requested. In addition, rejoinder of withdrawn dependent claims 36, 37, 42 and 52 is requested.

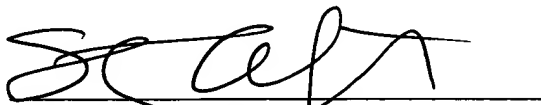
An Information Disclosure Statement is being filed concurrently with this Amendment. Also, please note that

Information Disclosure Statements were previously filed on April 30, 2004 and September 30, 2004.

Should any issues arise that will advance this case to allowance, the Examiner is asked to contact the undersigned by telephone.

DATED this 3rd day of December, 2004.

Respectfully submitted:



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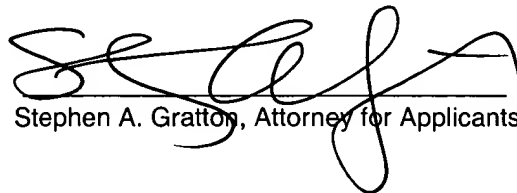
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December 3, 2004

Date of Signature



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